

REMARKS

Claims 65-67, 69, 75-90, and 92-100 are pending in the present application. In the Office Action dated January 18, 2007, claims 65-69 and 75-100 were provisionally rejected on the ground of non statutory obviousness-type double patenting as being unpatentable over claims 70-100 of co-pending U.S. Patent Application No. 10/817,495 to Hudson ("Hudson"). Claims 65-67, 69, 75-90 and 92-100 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,077,437 to Hayashi et al. ("437 patent") in view of U.S. Patent No. 6,106,714 to Chiu et al. ("Chiu"). Claims 65-67, 69, 75-90, and 92-100 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,352,469 to Miyazaki et al. ("Miyazaki") in view of U.S. Patent No. 6,039,649 to Roberts et al. ("Roberts").

Nonstatutory Double Patenting Rejection

The Applicant elects to wait to determine whether a terminal disclaimer will be required depending on the patentability of the claims in this application and the claims in co-pending Application No. 10/817,495.

Rejections Under 35 U.S.C. 103(a)

The embodiments disclosed in the present application will now be discussed in comparison to the cited references. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the cited references, does not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

The present application is generally directed to a system for providing planarizing slurries for planarizing microelectronic-device substrate assemblies in mechanical and/or chemical-mechanical planarization (CMP) processes. In one embodiment, the slurry manufacturing assembly includes two separate reservoirs each containing a fresh (i.e., not previously used) solution of slurry with a plurality of abrasive particles. The first reservoir contains abrasive particles of a first size, and the second reservoir contains abrasive particles of a second size, the first particle size being different from the second. The first reservoir is coupled to a first feed line and removal unit, and the second reservoir is coupled to a second feed line and removal unit. A combination feed line is coupled to the first and second removal units and contains a combined flow of the first and second solutions.

The Examiner maintains the 103(a) rejection using the Hayashi et al. '437 reference in view of Chiu et al. The Hayashi '437 reference discloses a planarizing apparatus including a slurry manufacturing assembly for recycling a used planarizing solution and mixing it with a fresh unfiltered slurry. The Examiner cited Chiu for disclosing using a filter with fresh slurry. However, there is no indication in the Chiu reference that the slurry is fresh, and the examiner bears the burden of proving that a prior art reference relied upon for a 103 rejection discloses the limitation either expressly, implicitly, or inherently. MPEP 2112. Clearly, the Chiu reference does not explicitly disclose that the slurry being filtered is fresh slurry. Therefore, the issue is whether the Chiu reference implicitly or inherently discloses fresh slurry being filtered. The Examiner contends that because (1) the reference does not say whether it is recycled or fresh, (2) the figures in the Chiu reference disclose slurry being supplied to a polishing pad from a slurry supply machine, and (3) the specification states that before slurry can be transported to the polishing pad, the slurry has to be filtered by a filtering apparatus to protect the wafer from being scratched by impurities (figure 2 and column 1, lines 36-50), that, alone, indicates that the slurry is fresh. The problem with this argument is that, at the date of this reference, there is evidence that recycled slurry was commonly known to be filtered to remove impurities and supplied to a polishing pad via a slurry supply machine. For example, U.S. Patent No. 5,647,989 to Hayashi states that the *existing* technique for reclaiming spent (recycled) slurry is to use a conventional filter to remove particles that cause damage to the polishing surface. *Hayashi '989*, column 1, lines 55-63 (Emphasis added). Furthermore, the Hayashi '989 reference refers to the particles that cause damage to the polishing surface as impurities. *Id.* at column 4, lines 10-16. (Note: Hayashi '989 has a 1995 priority date and Chiu has a 1998 priority date). Because the existing technique for removing impurities from recycled slurry is to use filters, and because no other evidence has been provided to suggest that the slurry is fresh, it appears that the slurry referred to in Chiu is recycled. Furthermore, the reference does not suggest that there would be anything in the slurry to be filtered other than particles resulting from previous use of the slurry. Therefore, the Examiner has not met the burden of proving that a prior art reference discloses the limitation that the slurry is fresh.

Even assuming the Chiu reference suggests filtering fresh slurry, neither the Hayashi '437 reference nor the Chiu reference suggests *two separate slurries with different sized particles in each respective slurry* being filtered separately and then combined. (Emphasis added). The Examiner contends that because the Hayashi '437 reference discloses filtering a single slurry having

a bimodal distribution and combining it with an unfiltered single slurry also having a bimodal distribution, that alone, would suggest to a person having ordinary skill in the art to filter two separate slurries with different particles sizes within each respective slurry. In fact, the Hayashi '437 reference teaches away from using two separate slurries where each slurry has a different particle size. The filter used on the recycled slurry was used to get the recycled slurry to have a similar particle size distribution as the fresh slurry. *Hayashi '437 Specification*, column 12, lines 41-49 and column 13, lines 29-55. The particle size distribution of the fresh slurry is bimodal. Therefore, there is no suggestion or motivation to modify the Hayashi '437 reference to have one particle size in the recycled slurry and another particle size in the fresh slurry.

The Examiner maintains another 103(a) rejection using the Miyazaki reference in view of the Roberts reference. However, this combination fails to teach or suggest all of the claim limitations. The Miyazaki reference discloses a polishing apparatus having two separate feed lines so that the slurry can be continuously fed to the polishing pad from a first feed line and container when existing slurry from a second feed line and container is being replaced with a different type of slurry. However, the reference does not disclose or fairly suggest combining the feed lines. In addition, Roberts does not make up for the fact that the Miyazaki reference does not suggest combining the feed lines. The Examiner contends that if the Miyazaki reference disclosed a combination feed line, that would make it a 102 rejection. Even assuming that is true, if the Miyazaki reference does not disclose the limitation, then the Roberts reference must disclose or suggest it. The Roberts reference does not disclose this limitation. Rather, the Roberts reference is merely cited for disclosing a bimodal distribution of particles in a single slurry solution. Thus, neither reference discloses or fairly suggests combining the feed lines. Therefore, when combining Miyazaki with Roberts there is nothing to suggest using two separate reservoirs with different sized particles within the separate solutions, filtering the solutions separately, and then combining the two solutions.

In addition, there is no suggestion or motivation to combine the Miyazaki and Roberts references. The Miyazaki reference discloses two separate feed lines for the purpose of being able to continuously feed the slurry to the polishing pad from one container and feed line while the slurry from the other container and feed line is being replaced. The Roberts reference merely discloses a bimodal distribution of particles in a single slurry solution. Therefore, there is

no suggestion in the references themselves to combine the separate feed line apparatus of the Miyazaki reference with the bimodal distribution slurry in the Roberts reference.

The Examiner contends that the slurry is the process material for the apparatus, and therefore, inclusion of the slurry into the claims does not impart patentability of the claims. The Applicant agrees with the Examiner that an article being worked on by an apparatus does not impart patentability of the claims. However, the Applicant disagrees that the slurry is the process material of the apparatus being claimed. Rather, the Applicant contends that the article being worked on is the microelectronic-device substrate. In particular, the apparatus is used to planarize a substrate and the slurry is a part of the apparatus used to planarize the substrate. Looking at an electric sander as an example, the sand paper used on the electric sander is not the process material. Rather, it is part of the apparatus, and the article being sanded is the process material. Just because the slurry is placed inside of the apparatus does not make it the process material. The slurry of the present apparatus functions analogously to sand paper for an electric sander; just as sand paper is not the process material in an electric sander, slurry is not the process material in a planarizing tool. Thus, differences in the present application compared to the prior art in relation to the slurry does impart patentability of the claims.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. Claim 65 recites, in part, a first reservoir containing a first solution having a plurality of first abrasive particles of a first size, the first solution not having been previously used to planarize a microelectronic substrate, a second reservoir containing a second solution having a plurality of second abrasive particles of a second size, the first abrasive particles' size being different than the second abrasive particles' size, and a combination feed line containing a combined flow of the first and second solutions (see claim). Neither the combination of the Hayashi '437 reference in combination with the Chiu reference nor the Miyazaki reference in combination with the Roberts reference disclose filtering a slurry solution that has not been previously used to planarize a microelectronic substrate. Furthermore, neither the Hayashi '437 reference in combination with the Chiu reference nor the Miyazaki reference in combination with the Roberts reference disclose a first and second reservoir containing a first and second solution, respectively, where the first solution contains particles of a first size and the second solution contains particles of a second size that is different from the first, filtering each solution separately and then combining the two solutions into a combination feed line.

Claim 90 contains similar limitations to those in claim 65 discussed above (see claim) and is, therefore, patentable for at least the same reasons claim 65 is patentable.

All claims depending from 65 and 90 are allowable due to depending from an allowable base claim and further in view of the additional limitations recited in the dependent claims.

All of the claims remaining in the application are clearly allowable. Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,

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Enclosures:

Postcard

Fee Transmittal Sheet (+ copy)

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